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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,965	10/15/2003	David W. Bainbridge	I-28036	8637
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MACMILLAN SOBANSKI & TODD, LLC			VO, HAI	
ONE MARITIME PLAZA FIFTH FLOOR			ART UNIT	PAPER NUMBER
720 WATER STREET			1794	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/685,965 Examiner Hai Vo	Applicant(s) BAINBRIDGE, DAVID W. Art Unit 1794
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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 04 May 2009.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 39-71 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 39-71 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date, _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____.

1. The art rejections over Kasahara et al. (US 4,034,506) in view of DVD disc "Lectro Engineering Company, MTM Systems" and Frankel et al. (US 5,252,657) have been withdrawn in view of the present response (see pages 4 and 5 of the amendment filed May 04, 2009). However, upon further consideration, new ground of rejection is made in view of newly discovered reference to Bauman (US 4,880,879).
2. The art rejections over Kasahara et al. in view of Frankel et al. are maintained.
3. The 112 claim rejections are maintained.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 39-71 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Applicant asserts that the most important aspect of the present invention is that the composite material made from a plurality of adhesive coated beads, each bound to each other through adhesive-to-adhesive bonds are critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). The adhesive-to-adhesive bonds effectively provide the composite material with higher impact resistance than bead-to-adhesive bondings and bead-to-bead bondings (page 54 of the specification of the present invention, figures16-19). Additionally, Applicant has

discovered that the composite material made with electrical excitation zone treated beads exhibit five times the tensile strength of the composite material with untreated beads. Further, the electrical excitation zone treated beads are in combination with an adhesive to make *the subject composite material* (page 10, lines 5-10 of the specification of the present invention). Applicant also found that the breathability, water porosity, impact resistance, washability are achieved when the beads are pretreated with the electrical excitation zone before they are coated with adhesives (page 14, lines 5-20 of the specification). Accordingly, the bead having the surface treated with the electrical excitation zone prior to the adhesive coating and adhesive-to-adhesive bondings between the coated adhesive beads would be critical or essential to the practice of the invention. These limitations thus need to be included in the claims.

6. The 112 rejections, first paragraph have been maintained for the following reasons. Applicant contends that the use of electrical excitation zone treatment is neither critical nor essential to the practice of the invention. That is not true. The instant application of a continuation-in-part of application No. 09/684,470 which is completely silent as to the pretreated, adhesive coated beads. The beauty of the invention is basically about the treatment of the beads prior to the coating with an adhesive. Applicant has discovered that the composite material made with electrical excitation zone treated beads exhibit five times the tensile strength of the composite material with untreated beads. Further, the electrical excitation zone treated beads are combined with an adhesive to make *the*

subject composite material (page 10, lines 5-10 of the specification of the present invention). Applicant also found that the breathability, water porosity, impact resistance, washability are achieved when the beads are pretreated with the electrical excitation zone before they are coated with adhesives (page 14, lines 5-20 of the specification). Accordingly, it is not seen that the beads having the surfaces treated with the electrical excitation zone prior to the adhesive coating and adhesive-to-adhesive bondings would or could not be critical or essential to the practice of the invention. These limitations thus need to be included in the claims. It is suggested that substitution of original claims listed in the US Application Publication (US 2005/0025956), which are within the scope of the present invention for the present claims would be sufficient to overcome the 112 issues.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 39-71 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 39 and 69 appear to be grammatically ambiguous so as not to clearly and accurately convey the spatial relationship of the claimed elements; i.e., the beads and the adhesive material. The current phraseology is unclear as to how the beads and the adhesive are arranged. The scope becomes unclear since it is not determinable what structure can fall within the scope of the claim. Various interpretations, including

some radically different arrangements are possible but do not seem within the scope of the disclosed invention.

9. The 112 rejections, second paragraph have been maintained for the following reasons. The examiner directs Applicant's attention to page 15, lines 5-20 and page 59, lines 20-30 of the specification. That is to say that at least 50 percent of a pretreated bead's surface area is covered with an adhesive material and less than 20 percent of the beads in a given padding material will fail to be at least 50 percent coated with an adhesive. On the contrary, the claim does not exclude the composite material wherein up to 50 percent of the beads in a given padding material could fail to be at least 50 percent coated with an adhesive. This does not fall within the scope of the present invention.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 69-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasahara et al. (US 4,034,506) in view of Bauman (US 4,880,879) and Frankel et al. (US 5,252,657). Kasahara discloses a porous foam plate disposed on the surface of water contained in the casing comprising an aggregate of foamed polyethylene beads having a diameter 2 to 20 mm (column 2, line 66) within the

claimed range. Kasahara discloses the foamed polyethylene beads being coated with a liquid adhesive that represents about 52 wt% of the foam plate (reference example, column 7, lines 5 and 11). Kasahara discloses the foamed beads being blended with a liquid adhesive (column 3, line 65 to column 4, lines 1-5). Likewise, the foamed beads would substantially have the entire surfaces coated with the liquid adhesive. The adhesive is made from a two-part thermoplastic resin or a two-part thermosetting resin (column 3, lines 25-60). Kasahara discloses a porous foam plate having a porosity of 37 volume percent and continuous open spaces among the adjacent beads, which reads on Applicant's regular void distribution (column 7, line 38, and abstract). Kasahara discloses the granular bead which reads on Applicant's spherical shape (column 5, line 60). Kasahara does not disclose the ellipsoid shape of the bead. However, the bead has a diameter within the claimed range and it appears the shape is dictated by the bead diameter. Therefore, it is not seen that the bead of Kasahara could have a shape different than that of the bead of the present invention. Kasahara does not disclose the inelastic or elastic properties of the bead. However, Kasahara uses the same material to form a bead as Applicant, i.e., polyethylene or polystyrene, it is the examiner's position that the inelastic or elastic properties should be inherently present. Like material has like property. This is in line with *In re Spada*, 15 USPQ 2d 1655 (1990) which holds that products of identical chemical composition can not have mutually exclusive properties. Kasahara discloses that the adhesive is cured from a liquid state

while in initial contact with the beads. Kasahara discloses the liquid adhesive having a viscosity of about 3 to 1000 cps at 20°C and solid content of 20 to 60 wt% based on the total weight of the adhesive (column 3, lines 5-10). Kasahara does not specifically disclose the hardness of the adhesive. Frankel, however, teaches an acrylic emulsion being useful as an adhesive (column 15, lines 25-26) and having a viscosity of about 3 to 1000 cps and solid content of 20 to 60 wt% based on the total weight of the adhesive. Frankel discloses that the adhesive having a shore A hardness of 25 within the claimed range (table V, example 15). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the adhesive having a hardness as described by Frankel as the adhesive of Kasahara motivated by the desire to provide a porous foamed plate with improved toughness and tensile strength.

Kasahara does not specifically disclose the beads having electrical excitation zone-treated surfaces. Bauman, however, discloses the polyethylene powdered material having been surface treated with plasma. The surface treatment increases the surface tension of the polyethylene particles to a value of at least 40 dyne/cm to insure sufficient bonding of the particles to the polymeric material. Note that Bauman is non-analogous art. However, Bauman is reasonably pertinent to the particular problem with which the applicant was concerned, namely increasing the surface tension of the polyethylene particles to a value of at least 40 dyne/cm to insure sufficient bonding of the particles to the adhesive material. Therefore, it would have been obvious to one having

ordinary skill in the art at the time the invention was made to have the surface of the polyethylene beads treated with the plasma discharge prior to mixing the beads with the adhesive material motivated by the desire to provide an increase in the surface energy of the beads, thereby enhancing adhesion strength between the adhesive material and the beads.

Kasahara as modified by Bauman and Frankel does not specifically disclose that the beads are electrical excitation treated more than once to accomplish more than one kind of treatment. However, it is a product-by-process limitation not as yet shown to produce a patentably distinct article. It is the examiner's position that the foam plate of Kasahara as modified by Bauman and Frankel is identical to or only slightly different than the claimed composite structure prepared by the method of the claim, because both articles are formed from the same materials, having structural similarity as discussed above. It is noted that if the applicant intends to rely on Examples in the specification or in a submitted Declaration to show non-obviousness, the applicant should clearly state how the Examples of the present invention are commensurate in scope with the claims and how the Comparative Examples are commensurate in scope with Kasahara/Bauman/Frankel.

12. Claims 39, 40, 43, 45-48, 53, 54, 56-61, and 63-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasahara et al. (US 4,034,506) in view of Frankel et al. (US 5,252,657). Kasahara discloses a porous foam plate disposed on the surface of water contained in the casing comprising an

aggregate of foamed polyethylene beads having a diameter 2 to 20 mm (column 2, line 66) within the claimed range. Kasahara discloses the foamed polyethylene beads being coated with a liquid adhesive that represents about 52 wt% of the foam plate (reference example, column 7, lines 5 and 11). Kasahara discloses the foamed beads being blended with a liquid adhesive (column 3, line 65 to column 4, lines 1-5). Likewise, the foamed beads would substantially have the entire surfaces coated with the liquid adhesive. The adhesive is made from a two-part thermoplastic resin or a two-part thermosetting resin (column 3, lines 25-60). Kasahara discloses a porous foam plate having a porosity of 37 volume percent and continuous open spaces among the adjacent beads, which reads on Applicant's regular void distribution (column 7, lines 38, and abstract). Kasahara discloses the granular bead which reads on Applicant's spherical shape (column 5, line 60). Kasahara does not disclose the ellipsoid shape of the bead. However, the bead has a diameter within the claimed range and it appears the shape is dictated by the bead diameter. Therefore, it is not seen that the bead of Kasahara could have a shape different than that of the bead of the present invention. Kasahara does not disclose the inelastic or elastic properties of the bead. However, Kasahara uses the same material to form a bead as Applicant, i.e., polyethylene or polystyrene, it is the examiner's position that the inelastic or elastic properties should be inherently present. Like material has like property. This is also in line with *In re Spada*, 15 USPQ 2d 1655 (1990). Kasahara discloses that the adhesive is cured from a liquid state while in initial contact with

the beads. Kasahara discloses the liquid adhesive having a viscosity of about 3 to 1000 cps at 20°C and solid content of 20 to 60 wt% based on the total weight of the adhesive (column 3, lines 5-10). Kasahara does not specifically disclose the hardness of the adhesive. Frankel, however, teaches an acrylic emulsion being useful as an adhesive (column 15, lines 25-26) and having a viscosity of about 3 to 1000 cps and solid content of 20 to 60 wt% based on the total weight of the adhesive. Frankel discloses that the adhesive having a shore A hardness of 25 within the claimed range (table V, example 15). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the adhesive having a hardness as described by Frankel as the adhesive of Kasahara motivated by the desire to provide a porous foamed plate with improved toughness and tensile strength.

The preamble “construction material”, “padding material” have not given patentable weight because it has been held that a preamble is denied the effect of a limitation where the claim is drawn to a structure and the portion of the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951).

Kasahara does not specifically disclose the porous foam plate being placed in a cloth casing or in a net casing. The examiner takes Official Notice that it is common and well known in the hydroponics art to use the porous foam plate in combination with a cloth casing or a net casing. As such, it would have

been obvious to a person having ordinary skill in the art to place the porous foam plate in the cloth casing or in the net casing because the cloth or the net is sufficiently permeable to water and air, exerts no harmful influence on the growth of the plants.

13. Claims 41, 42, 49, 50 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasahara et al. (US 4,034,506) in view of Frankel et al. (US 5,252,657) as applied to claim 39 above, further in view of Shannon et al. (US 4,777,763). Kasahara does not specifically disclose the beads formed from hollow ceramics or glass. Shannon, however, teaches a plant growing board for use in hydroponic gardening comprising polyethylene hollow beads, glass, clay hollow beads blended with the fibers to enable the board to float (column 8, lines 25-30). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the glass or clay hollow beads in combination with the polyethylene beads because such is an intended use of the material and Shannon provides necessary details to practice the invention of Kasahara.

14. Claims 44 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasahara et al. (US 4,034,506) in view of Frankel et al. (US 5,252,657) as applied to claim 39 above, further in view of Schwab et al. (US 3,877,172). Kasahara does not specifically disclose the beads formed from a thermosetting material. Schwab, however, teaches a foamed plastic profile member for hydroponic cultivation comprising a plurality of foam pieces held together by a

foamed binder as shown in figure 8. Schwab teaches the foam pieces made from a polyurethane, polystyrene and urea formaldehyde (column 5, lines 35-40). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the thermosetting material for the thermoplastic material to form the beads because two foam materials have been shown in the art to be recognized equivalent materials for use in the hydroponic cultivation and growth of plants.

15. Claims 51 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasahara et al. (US 4,034,506) in view of Frankel et al. (US 5,252,657) as applied to claim 39 above, further in view of Tully et al. (US 3,710,510). Kasahara does not specifically disclose the bead being coated with a coupling agent comprising silane as disclosed in the specification. Tully, however, teaches a plant growth media comprising expanded clays with a variety of particle sizes and coated with silane to render hydrophobic so as to sustain growth of young seedlings and to provide maximum opportunity for development of root system (column 2, lines 20-32, column 5, lines 10-30). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use expanded clays with a variety of particle sizes and coated with silane to render hydrophobic so as to sustain growth of young seedlings and to provide maximum opportunity for development of root system.

Response to Arguments

16. The art rejections over Kasahara in view of DVD and Frankel have been withdrawn in view of the present response. There is no motivation to have the outer surface of the porous plate of Kasahara treated with a process disclosed in the DVD reference because the porous plate is not intended to be laminated to other material.

17. The art rejections over Kasahara in view of Frankel have been maintained for the following reasons. It is true that Shannon et al. (US 4,777,630), Minoji (US 5,921,024) and JP63-14562 are not part of the basis of the rejections; however, they are relied on as evidence showing that Applicant's arguments that improved toughness and tensile strength of Kasahara's foam plate would result in a structure which is unsuitable for use in the hydroponics are factually flawed. As there is an incentive, a guidance to combine the teachings of Frankel and Kasahara, the combination of the references is sufficient to make out the obviousness rejections. The examiner notes that Frankel discloses the liquid adhesive can have a hardness ranging from 0 to 45. Frankel teaches away from the adhesive formulation having the hardness ranging from 75 to 85 (see comparative examples 16 and 17). One skill in the art would be motivated to regulate the hardness of the adhesive composition to obtain the desired tensile strength of the final product. But no one would have known to combine the adhesive hardness ranging from 60 to 95 with the adhesive quantity, and the void volume to achieve the desired impact resistance of the composite material.

Therefore, incorporation of additional limitations of the impact resistance and hardness shore A from 60 to 95 into original claim 1 listed in US Patent Application Publication (US 2005/0025956) would put the instant application in condition for allowance.

Conclusion

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai Vo whose telephone number is (571) 272-1485. The examiner can normally be reached on Monday through Thursday, from 9:00 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on (571) 272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service

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Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hai Vo/
Primary Examiner, Art Unit 1794